Section 1. Introduction

1.1 Purpose

The purpose of the *Earth Observing System (EOS) Ground System (EGS) System and Operations Concept* (ESOC) document is to present an end-to-end view of EGS operations. This document provides a unified description of the activities performed by the EGS elements, with major emphasis on the elements of the EOS Data and Information System (EOSDIS).

This document is intended to assist EOS investigators and other users in understanding EGS capabilities and user interfaces, and to aid developers of EGS elements in interpreting the level 2 requirements. It is also intended to support the Earth Science Data and Information System (ESDIS) Project and its component projects in evaluating the operational feasibility of the planned evolution of the EOSDIS, and in assessing the impact of proposed changes to EOSDIS requirements and designs at all levels. This document is not intended to dictate design decisions at any level of implementation.

1.2 Scope

The scope of this document is limited to a level 2 operations concept that is responsive to ESDIS Project level 2 requirements and to the companion interface requirements documents and memoranda of understanding. This document is intended to supplement the *EOS Mission Operations Concept* and the *EOS Science Operations Concept* by providing a description of EGS operations as they support the flight and science missions. The level of detail provided in this document is consistent with the ESDIS Project level 2 requirements.

The descriptions presented in this document are based on nominal operations for the AM-1 mission. However, the scenarios presented are generally applicable to all EOS missions, and can be updated for multi-mission operations.

1.3 Organization and Contents

This document contains four sections, a list of abbreviations and acronyms, and a glossary.

Section 1 defines the document's purpose and scope; describes its organization and contents; identifies the assumptions and conventions used in preparing it; and lists other documents relevant to its contents.

Section 2 presents an EOS mission overview, to place the EGS in the context of the National Aeronautics and Space Administration's (NASA's) Mission to Planet Earth (MTPE) and the EOS Program. The EOS Program mission objectives and principal mission requirements are presented, the major EOS segments and international participation in the Program are briefly described, and the general operations concept for EOS missions is summarized.

Section 3 describes the EGS. It presents the goals and objectives, key requirements, and a reference architecture. The EGS components and capabilities are described, and the implementation approach and evolution of operations capabilities are discussed.

Section 4 describes EGS operations. It discusses mission operations, science data operations, EGS monitoring and coordination, and operations support. The functions and processes that comprise each category of operations are described at a summary level.

1.4 Assumptions and Conventions

The concepts presented in this document are intended to be consistent with the operations concepts defined for the EGS elements. The descriptions and scenarios presented in this document use elements from the design of each system to indicate where specific functions are expected to reside, in order to explain the processes under discussion.

The terminology used in this document is consistent with that used in EOS Program and ESDIS Project documents. Where applicable, specific terms used in relevant documents prepared by EGS system projects have been adopted to retain the level of precision provided in those documents.

Editorial conventions used in this document are consistent with the *Specification for Document Formats*, with the following exceptions:

a. Use of acronyms:
    1. Acronyms are spelled out on the first use in each section, except for MTPE, EOS, EOSDIS, the EOSDIS elements and their components, and United States (U.S.) government agencies and international partner organizations; these are spelled out only on the first use in the document.
    2. Acronyms for spacecraft instruments are not spelled out in the text; full spell-outs are provided in the acronym list.
    3. For words that have acronyms that would be used only once in this document, the acronym is not noted either in the text or in the acronym list.
    4. Acronyms used in figures and tables but not in the text are included in the acronym list; they may or may not be spelled out in the graphics.

b. To facilitate future updates to this document, all figures and tables are numbered according to the section or major subsection in which they are presented (e.g., Figure 4-1, Figure 4.1-1, and Figure 4.2-1 vs. Figure 4-1, Figure 4-2, and Figure 4-3).

c. To assist the reader in differentiating between specific documents and categories of documents, the titles of individual documents called out in the text are italicized (e.g., *EOS Mission Operations Concept* [specific document] vs. operations concept documents [category of documents]).

1.5 Applicable Documents

1.5.1 Precedence

In case of differences between this document and the documents listed below, the latest versions of the documents listed in Sections 1.5.2 and 1.5.3 take precedence over this document.

1.5.2 Requirements

a. 170-01-01, Revision A, *Execution Phase Project Plan for Earth Observing System (EOS)*, May 1995

b. *Earth Science Data and Information System (ESDIS) Project Level 2 Requirements*

1. 423-10-01-0, Volume 0: Overall ESDIS Project Requirements, February 18, 1993
2. 423-10-01-1, Volume 1: EOSDIS Core System (ECS), May 21, 1993
3. 423-10-01-2 (previously GSFC 423-35-01), Volume 2: EDOS and Ecom Requirements, March 17, 1992
4. 423-10-01-3, Volume 3: Other ESDIS Project Requirements, October, 1995
5. 423-10-01-5, Volume 5: EOSDIS Version 0, September 13, 1993
6. 423-10-01-6, Volume 6: EOSDIS Backbone Network (Ebnet) Requirements, December, 1995

1.5.3 Operations Concepts

a. GSFC/MO&DSD, *EOS Mission Operations Concept Document*, June 1995

b. STX/EOSDIS 91-01, *EOS Science Operations Concept*, December 1991

c. 604-CD-001-003, *ECS Operations Concept for the ECS Project: Part 1 - ECS Overview*, June 1995

d. 604-CD-002-003, *Operations Concept for the ECS Project: Part 2B - ECS Release B*, March 1996

e. 604-CD-004-001, *ECS Operations Concept for the ECS Project: Part 2, FOS*, October 1995

f. 560-EDOS-0106.002, *EOS Data and Operations System (EDOS) Operations Concept*, December 18, 1992 (with DCN 006, March 15, 1995)

g. 515-3OCD/0194, *EOSDIS Test System (ETS) Operations Concept* (Review), May 1995

h. (no document number), *Mission Operations Concept Document for the Landsat 7 Ground System*, July 1995

i. TRMM-490-080, *Tropical Rainfall Measuring Mission Operations Concept*, July 1993

1.5.4 Other Documents

a. *EOS Ground System Architecture Description Document (ADD*), June 1996

b. (no document number), *ESDIS Project Project Management Plan* (2nd Draft), February 27, 1995

c. NASA NP-215, MTPE *EOS Reference Handbook*, 1995

d. 560-EDOS-0211.0001, *Interface Requirements Document (IRD) between the EDOS and the EOS Ground System (EGS) Elements*, December 18, 1992 (with DCN 006, April 17, 1995)

e. 500-TIP-2110, *Specification for Document Formats*, August 1992 (Revision 1)